REMARKS/ARGUMENTS

Claims 1-12 remain in this application.

Applicant wishes to thank the Examiner for the courtesies extended during the interview with Applicant's representative held on September 1, 2005. Embodiments of the invention were discussed with respect to the difference between the "highly" ionized state of the claims and the abnormal and super glow discharge states of the prior art of record. It was agreed that Applicant would submit an amendment clarifying the meaning of the "highly ionized" state. Accordingly, independent claims 1 and 8 have been amended to clarify that the plasma adopts a state of ionization substantially higher than that of an abnormal glow discharge state without first adopting an arc discharge state. Support for the amendatory language may be found for example at p. 4 ll. 24-31.

Rejection Under 35 USC § 102(b)

Claims 1, 3, 5, 8, 9 and 11 are rejected under 35 USC § 102(b) as being anticipated by Sellers (U.S. 5,810,982). Claims 1 and 8 have been amended to clarify that the plasma adopts a state of ionization substantially higher than that of an abnormal glow discharge state without first adopting an arc discharge state. Sellers does not disclose a plasma having a state of ionization higher than that of an abnormal glow discharge state, let alone a plasma that adopts such a higher ionization state without first adopting an arc discharge state. The "super glow" discharge state of Sellers is in fact what is customarily termed an abnormal glow discharge state, as can be seen by comparing Figure 2 of Sellers with Figure 1 of U.S. Patent No. 6,296,742 to Kouznetsov, and Figure 4 together with the text at col. 4 ll. 40-43 of U.S. Patent No. 5,015,493 to Gruen. Sellers expressly teaches that operation at an ionization state higher than that of an abnormal or "super glow" discharge is to be avoided (col. 6 ll. 17-29). Because Sellers does not disclose either expressly or inherently a plasma that adopts such a higher ionization state without first adopting an arc discharge state, a rejection under 35 USC § 102(b) is not appropriate. This feature is therefore also missing from claims 3 and 5

which depend from claim 1, and claims 9 and 11 which depend from claim 8. Thus, none of these claims are anticipatcd by Sellers.

Claims 1, 3, 5, 8, 9 and 11 are rejected under 35 USC § 102(b) as being anticipated by Gruen (U.S. 5,015,493). Claims 1 and 8 have been amended to clarify that the plasma adopts a state of ionization substantially higher than that of the abnormal glow discharge state of Gruen without first adopting an arc discharge state. Gruen does not disclosc a plasma having a state of ionization higher than that of an abnormal glow discharge state, let alone a plasma that adopts such a higher ionization state without first adopting an arc discharge state. This feature is therefore also missing from claims 3 and 5 which depend from claim 1, and claims 9 and 11 which depend from claim 8. Thus, none of these claims are anticipated by Gruen.

Claims 1-3, 5, 8, 9 and 11 are rejected under 35 USC § 102(b) as being anticipated by Kouznetsov et al. "A novel pulsed magnetron sputter technique utilizing very high target power densities," Surface and Coatings Technology 122 (1999) 290-293. Kouznetsov does not disclosc a plasma having a state of ionization higher than that of an abnormal glow discharge state, let alone a plasma that adopts such a higher ionization state without first adopting an arc discharge state. The reference to 70% ionization in Kouznetsov relates to an ionization of a target matcrial (copper), not to an ionization state of a plasma. *See, e.g.*, p. 290 (ionizcd fraction of material sputtered from a *Cu target* was estimated to be approximately 70%). Becausc Kouznetsov does not disclose either expressly or inherently a plasma that adopts such a higher ionization state without first adopting an arc discharge state, a rejection of claims 1 and 8 under 35 USC § 102(b) is not appropriate. This feature is therefore also missing from claims 2, 3 and 5 which depend from claim 1, and claims 9 and 11 which depend from claim 8. Thus, none of these claims are anticipated by Kouznetsov.

Rejection Under 35 USC § 103(a)

Claims 1, 3-12 are rejected under 35 USC § 103(a) as being unpatentable over Sellers (U.S. 5,810,982 or Gruen (U.S. 5,015,493) or Kouznetsov et al. "A novel pulsed magnetron sputter technique utilizing very high target power densities," Surface and Coatings Technology 122 (1999) 290-293, in view of Manley (U.S. 5,682,067). "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be some reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claimed limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure." MPEP § 706.02(j) (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

The combination of Sellers, Gruen, or Kouznetsov and Manley does not teach all of the claimed limitations of any of claims 1 and 3-12. As amended, claims 1 and 8 require that the plasma adopt a state of ionization substantially higher than that of an abnormal glow discharge state without first adopting an arc discharge state. For the reasons discussed above, this feature is not disclosed in any of the cited references. This feature is also absent from claims 3-7 which depend from claim 1, and claims 9-12 which depend from claim 8. Thus, a rejection under 35 USC § 103(a) is not appropriate.

Moreover, the combination of Sellers, Gruen, or Kouznetsov and Manley discloses neither a suggestion nor motivation to modify the reference teachings, or a reasonable expectation of success. As the Examiner notes, the voltage control circuitry of Manley is directed to the problem of limiting the voltage applied to an electrode following actuation of arc suppression circuitry in the event of an arc. By comparison, voltage control circuitry of embodiments of the invention is directed to the problem of in avoiding an arc discharge state altogether by controlling voltage properties of a plasma. Hence, a rejection under 35 USC § 103(a) is not appropriate.

Double Patenting

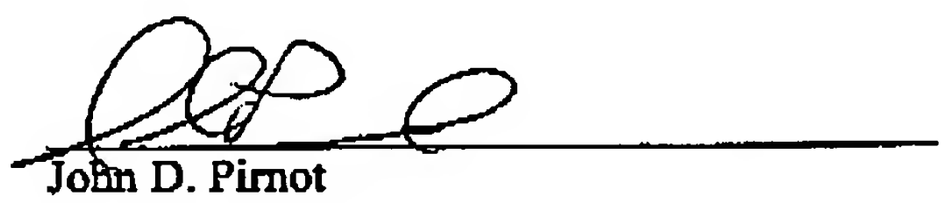
Claims 8-12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,808,607 in view of Sellers (U.S. 5,810,982) or Gruen (U.S. 5,015,493) or Kouznetsov et al. "A novel pulsed magnetron sputter technique utilizing very high target power densities," Surface and Coatings Technology 122 (1999) 290-293. The combination of U.S. Patent No. 6,808,607 with Sellers, Gruen or Kouznetsov does not teach all of the claimed limitations of any of claims 8-12. In particular, the feature of a plasma adopting a state of ionization substantially higher than that of an abnormal glow discharge state without first adopting an arc discharge state is not disclosed in any of the cited references. Moreover, for the reasons set forth above, the combination of Sellers, Gruen, or Kouznetsov and U.S. Patent No. 6,808,607 discloses neither a suggestion nor motivation to modify the reference teachings, or a reasonable expectation of success. Thus, an obviousness-type double patenting rejection is not appropriate.

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Dated this 8th day of September, 2005.

Respectfully submitted,

ADVANCED ENERGY INDUSTRIES, INC.



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